

ISSN 0840-8440

PROCEEDINGS

TECHNOLOGY TRANSFER CONFERENCE 1988

November 28 and 29, 1988

Royal York Hotel

Toronto, Ontario

SESSION C

LIQUID AND SOLID WASTE

Sponsored by

Research and Technology Branch

Environment Ontario

Ontario, Canada

ABBO

Copyright Provisions and Restrictions on Copying:

This Ontario Ministry of the Environment work is protected by Crown copyright (unless otherwise indicated), which is held by the Queen's Printer for Ontario. It may be reproduced for non-commercial purposes if credit is given and Crown copyright is acknowledged.

It may not be reproduced, in all or in part, for any commercial purpose except under a licence from the Queen's Printer for Ontario.

For information on reproducing Government of Ontario works, please contact ServiceOntario Publications at copyright@ontario.ca

CP9

Abstract

Waste Management Planning for Pharmaceutical Industry. R. Makhija and R.A. Stairs, Department of Chemistry, Trent University, Peterborough, ON K9J 7B8.

A study of waste management practice in the pharmaceutical industry, began by the Ministry of the Environment, has been continued by us, beginning late in 1985. A questionnaire was sent to 70 addresses. After follow-up, 35 usable replies were received, the results of which are summarized in Table I. This table includes some unsolicited information, but does not show some concerns expressed by respondents. These included categories of wastes not in the questionnaire, the need for recycling of solvents especially, and some need for education in the intricacies of the regulations. It also does not show the wastes exempted as small quantities, which may yet add up to a problem.

It became clear that the questionnaire missed much information by neglecting the use of ordinary laboratory and process chemicals and solvents. The pharmaceutical industry is part of the chemical manufacturing industry, and should have been treated as such.

Disposal practices appear to be following established guidelines. Quantities and costs are not large; the total cost is a small part of the cost of doing business. Nevertheless, concerns emerged, including the wisdom of blanket small quantity exemptions, the fate of pharmaceuticals (waste and excreted) going to sewers, and the medicines discarded by householders. A number of respondents called for economic solvent recycling facilities.

The business of waste removal shows signs of becoming a near monopoly. Two firms handled 95% of the tonnage transported.

We conclude that the wastes from this industry do not constitute a major problem in Ontario. There are, however, some questionable aspects, which should

A B B Q



(8548)

TD/5/T43

be addressed. For that end, we make the following recommendations.

Recommendations

1. We strongly recommend that small quantity exemptions for certain pharmaceutical wastes not be allowed. This will require further work in consultation with qualified environmental toxicologists and professional personnel from the waste generators.
2. We recommend that the existing MOE Household Hazardous Waste Program should include pharmaceutical waste days in as many municipalities as possible.
3. We recommend that generators of any wastes containing substances listed in Schedules 2A and 2B be required to register under Regulation 309. This should include wastes which would otherwise be exempted as being below the small quantity limit.
4. We recommend that encouragement be given to persons or companies from the private sector to set up a cost-effective solvent recovery system.
5. We recommend that further work be undertaken in the context of the Municipal Industrial Strategy for Abatement: sewer effluents from producers of drugs deemed to be environmentally hazardous should be analyzed, and if any notable emissions are found, the effluents from sewage-disposal facilities downstream should be analyzed for the same substances, in order to determine whether they escape biodegradation.
6. We recommend that qualified persons, with assistance from the Canadian Pharmaceutical Manufacturers Association and financial support from the Ministry of the Environment, offer educational seminars to generators of pharmaceutical wastes, including manufacturers and hospitals, especially concerning Regulation 309 and the 4 R's.
7. We recommend that a correlation of the trade names, generic names and

chemical names of pharmaceutical products and ingredients should be prepared in computer-readable form, and frequently revised and updated. This would greatly facilitate cross checking of manufacturers' lists against the various Ministry schedules.

TABLE I

Major Products of Pharmaceuticals	No. of Sources	Total Quantity disposed (kg)
Antineoplastics	5	53.2
Vaccines, Biologicals	5	18,233.2
Antihistamines, Antitussives and Expectorants	9	101.15
CNS drugs, Sedatives, Analgesics, Anticonvulsants and Anaesthetics	13	2,924.9
Psychotherapeutics	7	1,390.2
Cardiovascular agents	11	758.2
Corticosteroids, Hormones, Synthetic, Estrogens	11	415.0
Antibiotics	11	1,374.15
Organic Based Pharmaceuticals Otherwise not specified	12	22,623.2
Mineral Based Pharmaceuticals Otherwise not specified	9	190,020.0
Solvents	4	1,300